

Routing for On-Campus Approval of Degree Program Actions

Type of Action: Enter "X" for Action Type(s) and list Title and Prefix(s) as indicated

<input type="checkbox"/> New Degree Program	Proposed Program Title _____
<input checked="" type="checkbox"/> New Certificate Program	Proposed Certificate Program Title <u>Nuclear Nonproliferation Science & Policy</u>
<input type="checkbox"/> New Minor Program	Proposed Minor Program Title _____
<input type="checkbox"/> Change in Degree Program Title	Current Degree Program Title _____
<input type="checkbox"/> Change in Certificate Program Title	Current Certificate Program Title _____
	Proposed Certificate Program Title _____
<input type="checkbox"/> Change in Minor Program Title	Current Minor Program Title _____
	Proposed Minor Program Title _____
<input type="checkbox"/> Change in Course Prefix	Current Course Prefix _____ Proposed Course Prefix _____
<input type="checkbox"/> Program Discontinuation	

Proposed Effective Date August 2016 Program Contact: John Mattingly

Proposed CIP Code (see <https://nces.ed.gov/ipeds/cipcode/default.aspx?y=55>): 45.0902 & 14.2301

Routing of Action: Indicate date when the following occurs

Completed Appendix A and 1-page Concept Paper

_____ Council of Dean's- Approval to Plan

Completed Proposal

2.16.16 Department Head endorses*

2/17/16 College Curriculum Committee (undergraduate or graduate) recommends*

3.16.16 College Dean endorses*

Proposal moves to Undergraduate or Graduate office for routing

3/24/16 Recommended by Vice Provost, DELTA, if applies*

_____ Substantive Change Review Team (SCRT) informed

_____ If SACS notification is required, SCRT prepares letter for Chancellor to send to SACS

_____ University Courses & Curriculum Committee **or** Administrative Board of the Graduate School recommends

_____ Associate Deans Council **or** Graduate Operations Council informed

_____ Dean (Graduate School or DASA) approves*

Proposal move to the Provost's office for routing

_____ Vice-Provosts informed

_____ Deans' Council recommends*

_____ Provost approves*

_____ Chancellor's Executive Officer's (EOM) recommend

_____ University Council informed

_____ Board of Trustees subcommittees recommend

_____ Chancellor approves*

_____ Accreditation Liaison notifies SACS, if applicable

_____ Submitted to UNC-General Administration by Provost's Office

* Signature is required on the signature page for the action

**Proposal for a
Graduate Certificate in Nuclear Nonproliferation Science and Policy
North Carolina State University**

This request has been reviewed and approved by the appropriate campus committees and authorities.

Endorsed By:
Richard D. Mahoney, Director
School of Public & International Affairs

RDM Richard D. Mahoney Chair COE
Head, Department/Director of Graduate Program (Printed Name and Signature) mike devetski 2/17/2016
Date

Recommended By:

J Scott Despain J Scott Despain 2/17/2016
Chair, College Graduate Studies Committee (Printed Name and Signature) Date

Endorsed By:

Deanna Dannels Deanna Dannels 2/18/2016
College Dean (Printed Name and Signature) Doug Reeves COE, DEAN
Date

Recommended By:

Thomas K. Miller III Thomas K. Miller III 3/24/16
Vice Provost, DELTA (if DE degree) (Printed Name and Signature) Date

Approved By:

Dean of the Graduate School (Printed Name and Signature) Date

Recommended By:

Dean's Council (Printed Name and Signature) Date

Approved By:

Provost (Printed Name and Signature) Date

Approved By:

Chancellor (Printed Name and Signature) Date

**NC State University
Certificate Proposal Form**

Certificate Title: Nuclear Nonproliferation Science and Policy

New:

Revision:

Classification of Instructional Programs (CIP) Discipline # (6 digits): 45.0902 & 14.2301

*Please ensure that you select the appropriate CIP code for your certificate program. Please consult this website for more information about CIP codes: <https://nces.ed.gov/ipeds/cipcode/default.aspx?y=55>

Certificate Type:

On-Campus:

Distance:

On-Campus & Distance:

Proposed Effective Date: 5/1/2016

Director of the Certificate Program: John Mattingly

Program Coordinator (if different from Director): _____

Graduate Services Coordinator: Stefani Buster

College: Humanities and Social Sciences & Engineering

Department/Program: Political Science & Nuclear Engineering

Catalog Description:

The objective of the program is to educate students about nuclear nonproliferation, safeguards, and security from both the global and the technical perspectives. Students will be exposed to state-of-the-art techniques and will develop an understanding of the technical and policy challenges to maintain and support a robust nuclear nonproliferation regime. This process will be supported by assignments designed to reinforce understanding of the individual subject areas covered, class projects which cover key areas such as proliferation case studies and physical security simulations, as well as interactions with subject matter experts in nuclear nonproliferation technology and policy.

Projected Enrollment:

On-Campus	Yr. 1- <u>4</u>	Yr. 2- <u>5</u>	Yr. 3- <u>7</u>	Yr. 4- <u>10</u>
Distance	Yr. 1- <u>1</u>	Yr. 2- <u>2</u>	Yr. 3- <u>3</u>	Yr. 4- <u>5</u>

Attachments:

- Proposal Document
- Statement of other departments likely to be affected and summary of consultation with those departments
- Program-level assessment
- Campus Routing Form
- Signature Page

**Proposal for a
Graduate Certificate in Nuclear Nonproliferation Science and Policy
August 2015
North Carolina State University
College of Engineering
College of Humanities and Social Sciences**

Introduction

The Graduate Certificate in Nuclear Nonproliferation Science and Policy (NNSP GCP) is an interdisciplinary certificate program proposed jointly by faculty in the College of Humanities and Social Sciences and the College of Engineering. For a number of years, faculty in political science and nuclear engineering have collaborated on an Energy and Security Initiative sponsored by the Triangle Institute for Security Studies. This collaboration included faculty research projects, a joint speaker series, the development of interdisciplinary course offerings, and both major and minor grant applications. With the recent award of a major grant from the National Nuclear Security Administration, NCSU now leads the Consortium for Nonproliferation Enabling Capabilities (<http://www.cnec.ncsu.edu/>). The collaboration has also benefitted from a recent hire in political science—Robert Reardon. The institutional capacity now exists to expand on this collaboration through the creation of the NNSP GCP.

Description

The objective of the program is to educate students about nuclear nonproliferation, safeguards, and security from both the global and the technical perspectives. Students will be exposed to state-of-the-art techniques and will develop an understanding of the technical and policy challenges to maintain and support a robust nuclear nonproliferation regime. This process will be supported by assignments designed to reinforce understanding of the individual subject areas covered, class projects which cover key areas such as proliferation case studies and physical security simulations, as well as interactions with subject matter experts in nuclear nonproliferation technology and policy.

Learning Outcomes

- Characterize the dynamics of nuclear proliferation in association with nuclear fuel cycle technology development.

- Describe and discuss the history, structure, strengths and weaknesses of the nuclear nonproliferation regime.

- Identify and describe the technologies employed for nuclear nonproliferation and safeguards.

-- Describe how technology and policy work together to address the issues in nuclear nonproliferation and safeguards.

Program of Study

The NNSP GCP will require a total of four courses equaling 12 credit hours. The four courses may be taken from the list of Nuclear Engineering and Political Science offerings in Table 1. Students are required to take at least one course from each discipline. It is expected that most students will take three courses in their home discipline, but some students may choose to take an additional course outside their home discipline to promote interdisciplinary breadth. The GCP coordinator will consult with students on a program of study that will fulfill the GCP requirements.

Requirements for Admission

Students must meet **ONE** of the following requirements for admission into the NNSP Graduate Certificate Program:

- Have a BS degree in the sciences or engineering from an accredited four-year college or university, and have an overall (or major) GPA of at least 3.0 on a 4-point scale.
- Have a BA degree in the social sciences or humanities from an accredited four-year college or university, and have an overall (or major) GPA of at least 3.0 on a 4-point scale.
- Be a degree-seeking student in good standing in an NC State University graduate program in the sciences, engineering, social sciences, or humanities.

An application for acceptance into the GCP is required for all new students. Students must complete the Graduate School application, found at

<http://www.ncsu.edu/grad/applygrad.htm>.

Those applicants who are currently enrolled in an NC State graduate degree program need only provide the graduate student Certificate Plan Data Entry form, found at

<http://www.ncsu.edu/grad/faculty-and-staff/docs/grad-cert-plan-data-entry.pdf>.

New applications will be reviewed at the department/program level.

Registration procedures, registration dates and course availability for each semester can be found on the NCSU Registration and Records webpage at <http://www.ncsu.edu/registrar/>. Additional information regarding the NNSP GCP

can be found on the NNSP website (<http://www.NNSP.ncsu.edu>). Questions regarding the NNSP GCP can be directed to the NNSP certificate coordinator.

A student may obtain more than one certificate. Each certificate must have at least nine (9) credit hours that are unique to it.

Academic success in the NNSP GCP might have a strong bearing on admission to a graduate degree program. However, completion of a graduate certificate program IN NO WAY guarantees entry into a graduate degree program, which must be done through a separate application process.

Academic Performance Requirements

- To receive a Graduate Certificate, a student must maintain a minimum 3.00 grade point average (GPA) on all coursework taken at NCSU. All grades on courses taken towards the GCP in courses numbered 500 and above are included in the GPA. Any courses taken at the 400-level and below are not eligible for certificate credit and subsequently do not affect the graduate GPA.
- All courses taken for certificate credit must be completed with a grade of “B” or better.
- All courses taken for certificate credit must be letter-graded. Credit-only courses cannot be used for certificate credit.
- Transfer credit from other institutions is not allowed for the GCP. All coursework must be registered through NC State University.
- Up to six (6) hours of PBS coursework, if not already used in another graduate program, may be transferred into the GCP. All transfer credit must carry a grade of B or better.
- All GCP requirements must be completed within four (4) calendar years, beginning with the date the student commences courses applicable to the GCP. In addition, students must maintain continuous enrollment every semester until all coursework is completed. A one-semester leave of absence may be granted if the student is unable to enroll in a course due to extenuating circumstances. The leave of absence must be approved in writing by the certificate coordinator before the start of the semester.
- Up to two graduate certificate courses (6 hours) taken by students who are also enrolled in a graduate degree program may be double-counted with the degree courses, to the extent that the courses unique to the degree remain at 18 hours for a MS degree or 36 hours for a PhD degree.
- The transfer of graduate certificate courses taken prior to enrollment in a graduate degree program is limited to 12 hours (note: transfer totals from all sources shall not exceed 12 hours).

Program Administration

The NNSP GCP will be administered by a coordinator from the Department of Nuclear Engineering or the Department of Political Science. The initial coordinator from Nuclear Engineering, John Mattingly, will serve a one-year term. The coordinator position will thereafter alternate every year between departments and faculty.

The NNSP GCP coordinator will receive a small amount of staff support from existing resources. Initially the CNEC assistant director, Stefani Buster, will fill that role.

The implementation, management, and marketing of the NNSP GCP is not expected to require effort outside the normal academic activities of the course instructors and staff. No additional staff or resources will be required.

At the completion of the certificate, students will complete an exit survey for the purpose of evaluating the quality of the certificate program and its impact on students. The exit interviews will be conducted by the program coordinator. The results will be used to inform curricular improvement.

Enrollment Projection

Initial enrollment will be drawn from current students in the respective graduate programs in Nuclear Engineering and the School of Public and International Affairs. We project an initial annual enrollment of 5-7 students, but expect that the GCP will grow to perhaps 10-15 students in the next five years. (If substantially more students enroll in the program, additional teaching resources may be required.)

Faculty Participants

The faculty that teach the courses listed in Table 1 will participate in the NNSP GCP. The most recent faculty who have taught these courses, or are scheduled to teach them in 2015-16, are listed in Table 2. All of the instructors listed are members of the graduate faculty. Minor changes in the instructors for individual courses may occur each year to balance teaching loads with other faculty activities.

Distance Education Consultation

Bill Boettcher and John Mattingly, the PS and NE points-of-contact for the GCP, consulted with Linda Krute, Director of Distance Engineering Education Programs, to determine how to integrate distance education courses in to the GCP. The proposal requests approval for a distance program for off-campus students. The cost of the certificate will account for differences in tuition for PS vs. NE and on- vs. off-campus students.

Table 1
Courses for the Graduate Certificate in Nuclear Nonproliferation Science and Policy

Courses in Nuclear Engineering (Semester Offered) (Online)
NE 501- Reactor Analysis and Design (Spring) (No)
NE 504- Radiation Safety and Shielding (Fall) (Yes)
NE 505- Reactor Systems (Spring) (Yes)
NE 512- Nuclear Fuel Cycles (Fall) (Yes)
NE 520- Radiation and Reactor Fundamentals (Fall) (Yes)
NE 521- Principles of Radiation Measurement (Fall) (No)
NE 541- Nuclear Nonproliferation Technology and Policy (Spring) (No)
NE 723- Reactor Analysis (Fall) (No)
NE 751- Nuclear Reactor Design Calculations (Fall, Odd-Numbered Years) (No)
NE 770- Nuclear Radiation Attenuation (Fall, Even-Numbered Years) (No)
NE 795-008- Characterization of Special Nuclear Material (Spring, Even-Numbered Years) (No)
Courses in Political Science
PS 531- International Law (Spring) (No)
PS 533- Global Problems and Policies (Spring) (No)
PS 539- International Political Economy (Fall) (No)
PS 5**- Science, Technology, & International Security (Fall) (Needs to be captured)
PS 5**/NE 5**- Nuclear Nonproliferation Policy & Process (Spring) (Needs to be captured)
PA 507- The Public Policy Process (Spring) (No)
PA 511- Public Policy Analysis (Fall) (No)
PS 598 Nuclear Weapons Strategy and Proliferation (Fall) (Needs to be captured)

Table 2
**Faculty Teaching Course for the Graduate Certificate in Nuclear
 Nonproliferation Science and Policy**

Course	Instructor
NE 501	Dmitriy Anistratov, anistratov@ncsu.edu
NE 504	Gerald Wicks, wicks@ncsu.edu
NE 505	Michael Doster, doster@eos.ncsu.edu
NE 512	Paul Turinsky, turinsky@ncsu.edu
NE 520	Robert Hayes, rbhayes@ncsu.edu
NE 521	John Mattingly, john_mattingly@ncsu.edu
NE 541	John Mattingly, john_mattingly@ncsu.edu
NE 723	Dmitriy Anistratov, anistratov@ncsu.edu
NE 751	Paul Turinsky, turinsky@ncsu.edu
NE 770	Michael Doster, doster@eos.ncsu.edu
NE 795-008	John Mattingly, john_mattingly@ncsu.edu
PS 531	Michael Struett, mjstruett@ncsu.edu
PS 533	William Boettcher, william_boettcher@ncsu.edu
PS 539	Mark Nance, mtnance@ncsu.edu
PS 5**	Kathleen Vogel, kmvogel@ncsu.edu
PS 5** / NE 5**	William Boettcher, william_boettcher@ncsu.edu
PA 507	Jennifer Kuzma, jkuzma@ncsu.edu
PA 511	Jeffrey Diebold, jcdiebol@ncsu.edu
PS 598	Robert Reardon, rjreardo@ncsu.edu

Outcomes Assessment Plan

Objectives

1. In this certificate program, students will learn about nuclear nonproliferation, safeguards, and security from both the global and the technical perspectives. Students will be exposed to state-of-the-art techniques and will develop an understanding of the technical and policy challenges to maintain and support a robust nuclear nonproliferation regime.
2. The certificate program will provide an educational experience that satisfies the expectations of its graduates.

Objectives and Outcomes

1. By the time they complete this certificate program, graduates should be able to:
 - Characterize the dynamics of nuclear proliferation in association with nuclear fuel cycle technology development.
 - Describe and discuss the history, structure, strengths and weaknesses of the nuclear nonproliferation regime.
 - Identify and describe the technologies employed for nuclear nonproliferation and safeguards.
 - Analyze current nonproliferation policies and propose revisions based on current best practices.
2. At the time they complete this certificate program, graduates are expected to:
 - Be satisfied with the usefulness of the certificate program in enabling them to achieve their professional goals
 - Be sufficiently satisfied with the certificate program to recommend it to others with the same professional goals
 - Be satisfied with the appropriateness of the courses in providing the knowledge or training they anticipate needing for their professional goals
 - Be satisfied with the frequency and timeliness of courses offered for the certificate
 - Be satisfied with the quality of teaching in certificate courses
 - Be satisfied with the overall educational experience of the certificate program

Objective 1. Students will learn about nuclear nonproliferation, safeguards, and security from both the global and the technical perspectives. Students will be exposed to state-of-the-art techniques and will develop an understanding of the technical and policy challenges to maintain and support a robust nuclear nonproliferation regime.

Outcome	Evidence to be Collected	Source of Evidence	Frequency of Collection
Characterize the dynamics of nuclear proliferation in association with nuclear fuel cycle technology development.	Course exams and projects	Students	Annually
Describe and discuss the history, structure, strengths and weaknesses of the nuclear nonproliferation regime.	Course exams and projects	Students	Annually
Identify and describe the technologies employed for nuclear nonproliferation and safeguards.	Course exams and projects	Students	Annually
Analyze current nonproliferation policies and propose revisions based on current best practices.	Course exams and projects	Students	Annually

Objective 2. The certificate program will provide an educational experience that satisfies the expectations of its graduates.

Outcome	Evidence to be Collected	Source of Evidence	Frequency of Collection
Be satisfied with the usefulness of the certificate program in enabling them to achieve their professional goals	Exit Survey Administered by Graduate School	Graduate School	Annually
Be sufficiently satisfied with the certificate program to recommend it to others with the same professional goals	Exit Survey Administered by Graduate School	Graduate School	Annually
Be satisfied with the appropriateness of the courses in providing the knowledge or training they anticipate needing for their professional goals	Exit Survey Administered by Graduate School	Graduate School	Annually
Be satisfied with the frequency and timeliness of courses offered for the certificate	Exit Survey Administered by Graduate School	Graduate School	Annually
Be satisfied with the quality of teaching in certificate courses	Exit Survey Administered by Graduate School	Graduate School	Annually
Be satisfied with the overall educational experience of the certificate program	Exit Survey Administered by Graduate School	Graduate School	Annually